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RELATION BETWEEN THE COLORS AND THE MAGNITUDES OF THE BINARY STARS.

In 1880 I printed a note on a relation between the colors and magnitudes of the components of binary stars,* in which I showed that when every known case of binary stars of known colors was considered:

I. The components of the 122 binary stars, where the components are of the same color, differ in magnitude, on the average, only $0^m.5$.

II. The components of the 40 binary stars, where the components are of different colors, differ in magnitude, on the average, $2^m.4$.

Mr. W. M. PIERSON has recently communicated to the Society an interesting paper on this subject,† which has led me to re-examine the table which is printed in my paper. With the help of Mr. BURNHAM, I have extracted from his "General Catalogue of Double Stars" (which will probably be printed as Volume II of the *Publications of the Lick Observatory*) the distances of the components A and B of each pair of binary stars of the two classes named, I, when A and B are of like color; II, when A and B are of different colors. Omitting the case of 61 *Cygni*, I find that the average distance for class I is about $1''.3$, while the average distance for class II is about $2''.2$. It would seem, then, at least possible, that the similarity of the estimates of colors of the stars A and B for class I might arise, on the average, from the difficulty of distinguishing any difference of tint in stars so close together as $1''$, while the differences of color distinguished in the components of stars of class II might be largely due to the mere fact of their wider separation ($2''.3$ on the average), which would at least tend to make estimations of tint more trustworthy.

I believe it is a fact that it is a physiological peculiarity of the human eye to estimate *faint* stars more blue than they really are. It is also certain that unequal binary stars (where the component A is much brighter than B) are far more likely to be discovered when the distance is $2''$ or more than when it is $1''$. Considering these two facts, together with the reasoning which I have given on page 468 of the paper I have cited from the *American Journal of Science*, I am disposed to lay less stress on the conclusions of that paper than formerly, and I think these facts bear on the conclusions reached by Mr. PIERSON also. E. S. H.

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* *American Journal of Science*, vol. xix, June, 1880, p. 467.

† *Publications* A. S. P., vol. ii, No. 8, p. 105.